Notre Dame Radiation Laboratory

Ten Year Site Plan

2008-2017

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A. Executive Summary

The Notre Dame Radiation Research Building is basically sound and appropriate for the current Office of Science program, but is showing its age. The resources specified in the Site Maintenance Plan assume suitable escalation of costs, but our operating budget has no escalation and we are advised to expect none. Our commitment to Deferred Maintenance reduction is contingent upon (at least) a static funding situation.

Substantial investment in air conditioning has taken place during the past year. DM reduction projects in the near future will focus primarily on building plumbing. We do not anticipate any major issues coming to a head in the next five years.

B. Overview of Site Facilities and Infrastructure

The Notre Dame Radiation Laboratory (NDRL) is operated by the University of Notre Dame under Cooperative Agreement DE-FC02-04ER15533. The NDRL is located in the Radiation Research Building (RRB), a government-owned building sited on University-owned land on the campus of the University of Notre Dame. It is adjacent to the Stepan Hall of Chemistry and Biochemistry, which houses the University's Chemistry Department, and Malloy Hall, which houses the Theology and Philosophy Departments. These relationships are displayed in the figure in Appendix 2.

The RRB was constructed in 1962-1963. Underground vaults for accelerator and laser systems were added in 1976, 1985 and 1991. The building size is 65,400 gsf. Present occupancy is 50 persons (scientific faculty, support staff, visiting scientists, students and postdoctoral fellows). The NDRL operating budget for 2006 is $3,400,000.

The NDRL is 100% funded by the Office of Basic Energy Sciences (SC-BES). There are no non-SC facilities associated with the NDRL.

The Replacement Plant Value (RPV) for the RRB is $12,233,607 for FY2005. The Facility Condition Index (FCI) is 3.86% which falls within the good range (2% to 5%) specified by FIMS documentation. The corresponding Asset Condition Index (ACI) is 0.961. The Asset Utilization Index (AUI) for the NDRL is 1.000. The Maintenance Investment Index (MII) for FY05 was 1.15%.

Rehab and Improvement Costs (RIC) are $325,000 which results in a Total Summary Condition Index (TSCI) of 6.52%.

Summary of Expected Program Funding (in $000) and Staffing

	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17
Funding:													
SC – BES	3400	3400	3400	3400	3400	3400	3400	3500	3600	3700	3800	3900	4000
SC – HEP	0	0	0	0	0	0	0	0	0	0	0	0	0
SC – BER	0	0	0	0	0	0	0	0	0	0	0	0	0
SC – NP	0	0	0	0	0	0	0	0	0	0	0	0	0
SC – ASCR	0	0	0	0	0	0	0	0	0	0	0	0	0
SC – Fusion	0	0	0	0	0	0	0	0	0	0	0	0	0
Total SC	3400	3400	3400	3400	3400	3400	3400	3500	3600	3700	3800	3900	4000
Other DOE	0	0	0	0	0	0	0	0	0	0	0	0	0
Work for Others	0	0	0	0	0	0	0	0	0	0	0	0	0
Total $:	3400	3400	3400	3400	3400	3400	3400	3500	3600	3700	3800	3900	4000
Total Staffing: (FTE's)	34	34	33	33	32	32	31	32	33	34	35	36	37

Laboratory Space Distribution

Usage	GSA Use Code	Square Footage
Chemistry labs and other experimental areas	765	23,200
Office space (programmatic and administrative)	765	7,830
Technical support (Computer Services, Glass Shop, etc.)	765	6,380
Non-technical support (Library, Auditorium, storage areas, etc.)	765	4,930
Public Areas (Lobby, hallways, restrooms, stairways, elevator)	765	11,460
Building Infrastructure (Mechanical Room, utility chases, etc.)	765	11,600

C. Current and Future Missions for the Site

NDRL is a single-mission laboratory. The mission is to conduct a program of chemical effects produced by the absorption of energy from ionizing and nonionizing radiation by molecules in condensed phases. This program is supported by the program of Photochemistry and Radiation Research within the Division of Chemical Sciences, Geosciences and Biosciences, Office of Basic Energy Sciences. Radiation chemistry requires the application of ionizing radiation to chemical samples. At NDRL, the radiation is supplied by various electron accelerators and gamma radiation sources. The Radiation Research Building was designed, constructed and subsequently modified to accommodate such radiation sources.

It is not anticipated that the NDRL's mission will depart from that described above over the next ten years. However, personnel changes and changes in emphasis at BES will produce some shifts in programmatic thrust. Such programmatic redirection may require some building modifications.

Over the ten-year planning period, it is anticipated that the operating budget will remain static, and staffing levels will generally stay level. Any programmatic shift that involves substantial new equipment or a significant change in accelerator operations will necessitate alterations in the building. One such upgrade is contemplated for our Linear Accelerator; this is the only instance specifically reflected in this Ten-Year Site Plan.

The NDRL building is classified as Mission Critical.

There are no line item construction projects scheduled for the period covered by this Ten Year Site Plan.

D. Facilities and Infrastructure

1. *Vision, Goals, Strategy* Our vision is to attain a position as the premier site for radiation chemistry in the United States. The goal of F&I management at NDRL is to provide a building and infrastructure that best supports the radiation chemistry program that is our reason for existence. In the current era of constrained resources, our strategy is to pursue key radiation technologies that will provide us with unique capabilities. The Radiation Research Building was constructed in 1962-1963, so most of our F&I management issues revolve around repair and replacement of aging utility delivery systems, although space configuration for programmatic equipment is also important. In the past eight years, for instance, we have performed considerable work on the building's HVAC systems, and are presently undertaking improvements in our linear accelerator system. This work has been performed in a way that required very little down time for the ongoing scientific program activities.

2. *Process for Identifying F&I Needs and Development of Plans to Meet the VGS*

Since the NDRL is a single-mission laboratory with a single building, the Laboratory Director makes the final decisions on prioritization of needs and distribution of resources. The Director meets twice yearly with the Assistant Director and the Building Manager to review maintenance issues and resource allocation. This enables us to respond to programmatic shifts and to changes in the condition of our assets.

The building is inspected annually by NDRL maintenance personnel. Local contractors are utilized for special assessments and the associated estimates. Most estimates are based on experience and previous costs for similar work. Deficiency lists are maintained, but there is no CAS database.

3. *Land Use Plans* The University of Notre Dame owns and manages the land on which the Radiation Research Building is situated. NDRL does not have or need a Land Use Plan.

4. *Excess Real Property* NDRL has no excess real property. There are no expectations that the present facility will be identified as excess during the ten-year planning period.

5. *Long Term Stewardship* No LTS activities are underway or planned.

6. *Replacement Plant Value (RPV) Estimates*

RPV Estimates for the Planning Period

	RPV of existing facilities	Estimated Additions/ Eliminations	Total Estimated RPV (sum of columns A & B)
FY 08	13,097,289	0	13,097,289

FY 09	13,398,527	0	13,398,527
FY 10	13,706,693	0	13,706,693
FY 11	14,021,947	0	14,021,947
FY 12	14,344,452	0	14,344,452
FY 13	14,674,374	0	14,674,374
FY 14	15,011,885	0	15,011,885
FY 15	15,357,158	0	15,357,158
FY 16	15,710,373	0	15,710,373
FY 17	16,071,712	0	16,071,712

7. *Maintenance*

Site Maintenance Funding Plan

	SC Goal (2% of RPV)	Site Maintenance Funding Plan	Explanation if Funding Plan does not meet goal or results in deferred maintenance
FY 08	244,672	154,000	See text following table
FY 09	250,300	155,000	
FY 10	256,056	161,000	
FY 11	261,946	165,000	
FY 12	267,971	168,000	
FY 13	274,134	173,000	
FY 14	280,439	177,000	
FY 15	286,889	181,000	
FY 16	293,487	186,000	
FY 17	300,238	190,000	

The NDRL, faced with the prospect of flat operating budgets through the first half of the 10-year period and modest increases thereafter, conducted a staff reorganization in late CY2005. Part of the motivation for the reorganization was to provide NDRL management with greater flexibility in responding to maintenance issues: two positions with maintenance responsibilities were consolidated and, in the future, greater reliance will be placed on outside contractors for specific projects. The Site Maintenance Funding Plan accurately reflects the maintenance needs of the Radiation Research Building as well as the overall operating budget of the NDRL. We would find it difficult to absorb and spend the additional money called for by the SC Goal, both because we lack the manpower to oversee too many projects, and because the disruption to programmatic activities increases substantially in the presence of multiple maintenance projects. Deferred Maintenance could result from this Plan if funding from SC drops below that anticipated in B, above.

Major projects for 2007 and 2008 involve replacement of all windows and complete overhaul of the auditorium, as indicated in Appendix 4.

8. *Deferred Maintenance Reduction (DMR)*

Estimated DM and ACI Based on Site DMR and Other Funding

	SC DMR Funding Goal	Site DMR Funding Plan	Estimate of DM at the end of the Fiscal Year	Estimated ACI
FY 05	NA	NA	472,000	0.961
FY 06	NA	39,000	445,000	0.962
FY 07	NA	130,000	340,000	0.973
FY 08	NA	149,000	210,000	0.984
FY 09	NA	58,000	183,000	0.986
FY 10	NA	49,000	159,000	0.988
FY 11	NA	56,000	128,000	0.991
FY 12	NA	28,000	100,000	0.993
FY 13	NA	25,000	100,000	0.993
FY 14	NA	25,000	100,000	0.993
FY 15	NA	25,000	100,000	0.993
FY 16	NA	25,000	100,000	0.994
FY 17	NA	25,000	100,000	0.994

Based on DM listed in Appendix 4, plus estimated future deficiencies of $25,000 per year.

ACI at the NDRL is 0.96, in the "good" range. Planned maintenance activities will bring us into the "excellent" range within three years. Projects with DM components are listed in Appendix 4.

9. *Recapitalization and Modernization*

a) *IGPP* Not applicable.

b) *Line Items* NDRL has no plans for projects over $5M.

c) *GPP* Appendix 4 identifies all RIC projects and the recapitalization funding to accomplish these projects. For FY06 through FY12 the planned GPP funds total $850,000 which represents $645,000 for recapitalization and $205,000 for DM reduction.

10. *Space Bank Analysis* Not applicable.

11. *Site's Alternative Investment Plan* Not applicable.

12. *Performance Indicators and Measures* Normally formal performance indicators or measures are not included in Cooperative Agreements. There are none in the NDRL Cooperative Agreement. The DOE MII, ACI, and AUI metrics are discussed above.

13. *Energy Management* The Radiation Research Building is integrated into the utilities distribution network of the University of Notre Dame, and all utilities (power, steam and chilled water) are received from the University at direct cost.

Planned projects which involve energy management are the replacement of the windows with thermally efficient windows, the cleaning of the heat recovery coils and air ducts, and the replacement of the pneumatic blower controls. These items are detailed in Appendix 4.

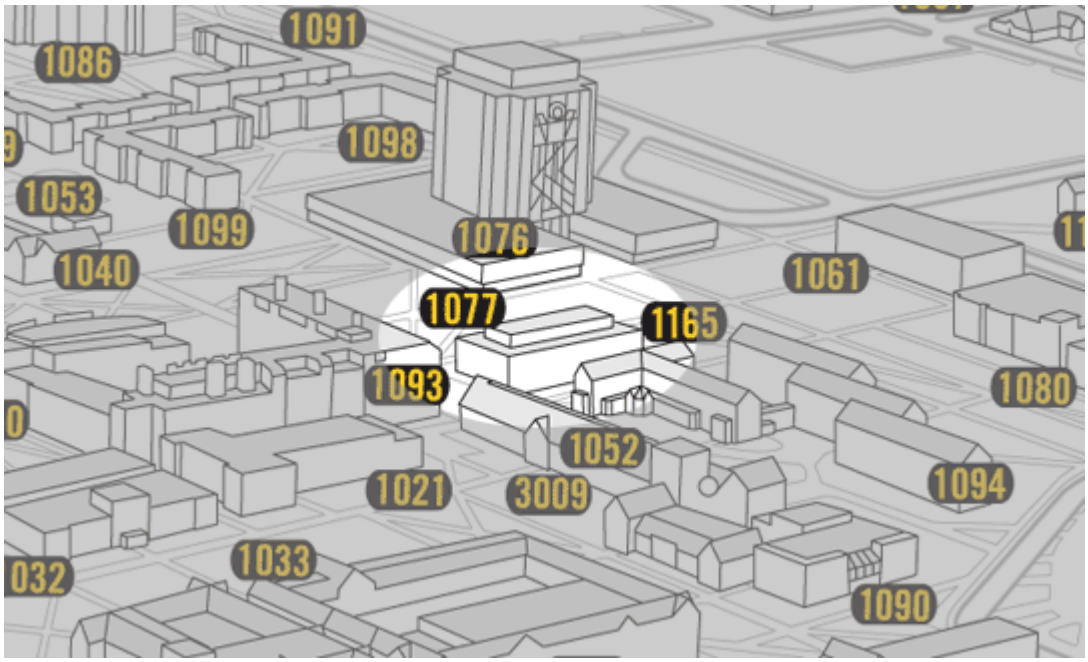
14. *Leasing & Third Party / Non-Federal Funded Construction of New Buildings* NDRL leases no additional space outside the government-owned Radiation Research Building. No construction of new buildings is planned for this site.

E. Appendices

Only two of the 8 Appendices are applicable for the NDRL. There is no Land Use Plan (app. 1), no maps of Infrastructure/Site Utility Systems (App. 3), no Line Item Projects (App. 5), no Facilities to be Formally Declared Excess (App. 6), no Excess Facility Projects (App. 7), and no GPP Information provided to Hqs (App. 8).

Appendix 2. Inventory and Map of Buildings.

The image below is taken from the Campus Map of the University of Notre Dame and shows the placement of the Radiation Research Building (1077) adjacent to the Stepan Hall of Chemistry and Biochemistry (1093) and Malloy Hall (1165).



Appendix 4. Integrated Facilities & Infrastructure Budget

The title document appears on the next two pages.